

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The regular diurnal period in temperature is shown by the hourly means given in Table IV for all stations having self-registers.

The mean temperature is given for each station in Table II, for voluntary observers, but in Table I, for the regular stations of the Weather Bureau, both the mean temperatures and the departures from the normal are given for the current month.

The monthly mean temperature published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

As compared with the normal for April, the mean temperatures for the current month were decidedly in excess over the interior, but deficient in the Pacific, south Atlantic, and the Gulf States. The region of greatest excess included the following: Winnipeg, 11.3; Minnedosa, 11.2; St. Vincent, 10.6; Moorhead, 10.4; Qu'Appelle, 9.5, and Huron, 9.0.

Considered by districts, the mean temperatures for the current month show departures from normal temperatures as given in Table I. The greatest positive departure was North Dakota, 9.1; the greatest negative departure was east Gulf, 2.6.

The years of highest and lowest mean temperature for April are shown in Table I of the REVIEW for April, 1894. The mean temperature for the current month ranged from 2.8 to 10.6 above the normal and was the highest on record at the following places: Baker City, Williston, Bismarck, St. Vincent, Moorhead, Rapid City, Pierre, Huron, St. Paul, Minneapolis, Sioux City, North Platte, Omaha, Des Moines, Dubuque, Concordia, Topeka, Wichita, Kansas City, Columbia, Mo., and Parkersburg. It was the lowest on record only at Jupiter and Port Eads.

The maximum and minimum temperatures of the current month are given in Table I. The highest maximum was Yuma, 98, on the 13th; the lowest maxima, Tatoosh Island, 57, on the 12th, and Eastport, 58, on the 21st. The highest minimum was Key West, 64, on the 4th; the lowest minimum, Northfield, 16, on the 1st.

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum

temperatures were the highest on record at Baker City, Red Bluff, La Crosse, Dubuque, Davenport, Keokuk, Springfield, and Columbia, Mo., St. Louis, and Harrisburg. The minimum temperatures were the lowest on record at Pysht, Eureka, Point Reyes Light, Carson City, Fresno, and Idaho Falls.

The greatest daily range of temperature and the extreme monthly range are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values among the greatest daily ranges were: Bismarck, 54; Havre, 50; Pierre, 49. The smallest values were: Tatoosh Island and Key West, 14; Hatteras and Block Island, 16; Nantucket and Galveston, 17. Among the extreme monthly ranges the large values were: North Platte, 66; Dubuque, 64; Bismarck, 63; Rapid City and Tucson, 62. The small values were: Key West, 20; Tatoosh Island, 24; Port Eads, 28, and San Francisco, 29.

The accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
North Dakota	+10.6	+2.6	New England.....	-4.6	-1.2
Missouri Valley	+1.9	+0.5	Middle Atlantic.....	-11.6	-2.9
Northern plateau	+11.3	+2.8	South Atlantic.....	-14.7	-3.7
North Pacific.....	+1.5	+0.4	Florida Peninsula.....	-11.4	-2.8
			East Gulf.....	-16.7	-4.2
			West Gulf.....	-13.3	-3.3
			Ohio Valley and Tenn....	-15.4	-3.8
			Lower Lakes.....	-11.7	-2.9
			Upper Lakes.....	-5.3	-1.3
			Upper Mississippi.....	-6.0	-1.5
			Northern slope.....	-1.0	-0.2
			Middle slope.....	-3.0	-0.8
			Southern slope (Abilene).....	-12.6	-3.2
			Southern plateau.....	-1.9	-0.5
			Middle plateau.....	-4.9	-1.2
			Middle Pacific.....	-0.5	-0.1
			South Pacific.....	-1.4	-0.4

The limit of freezing weather is shown on Chart VI by the isotherm of minimum 32° and the limit of frost by the isotherm of minimum 40°.

FROST.

The following reports of damage by frost have been received:

Chattanooga, 4th, young and tender plants damaged; Fresno, 5th, vegetables cut down; Independence, 5th, slight damage to fruit blossoms; Ager, Cal., 5th, killed apricots; Denton, Md., 12th, killed peaches; Pinal Ranch, Ariz., 14th, peaches and plums killed.

MOISTURE.

The quantity of moisture in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The rate of evaporation from a special surface of water on

muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporimeter may be made to give the quantity of water evaporated from a similar surface during any interval of time. Such an evaporimeter, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this evaporation the average humidity of the air during any given interval of time may be deduced.

The *sensible temperature* experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but equally upon the dryness and the wind. The temperature of the wet-bulb thermometer as obtained by the whirling apparatus used in the shaded shelter corresponds to the temperature felt by persons standing in the shade of trees or houses, exposed to a natural breeze of at least 6 miles per hour. The temperature of the wet-bulb thermome-

ter and its depression below the dry bulb are the fundamental data for all investigations into the relation between human physiology and the atmosphere. In order to present a monthly summary of the atmospheric conditions from a hygienic and physiological point of view, Table VIII has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the month of April, 1895, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III.

The precipitation for the current month was heaviest, 6 to 12 inches, on the immediate coasts of Washington and Oregon. Local rains of from 8 to 14 inches occurred in the interior of Georgia, North and South Carolina. Rainfall was least in Arizona, New Mexico, southern California, southern Nevada, Utah, and western Colorado, and averaged less than 0.5 over the greater part of the Rocky Mountain plateau region.

The *diurnal variation* is shown by Table XII, which gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 3 are weighing gauges.

The *normal precipitation* for each month is shown in the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, compiled to the end of 1891, with annual, seasonal, monthly, and other charts."

As compared with the normal for April the precipitation for the current month was in excess throughout the Atlantic States; and in western Washington and in the Upper Missouri Valley. Elsewhere it was generally deficient. The large departures from the monthly normals were: Excesses, Neah Bay, 6.0; Tatoosh Island, 4.9; Raleigh, 5.4; Lander, 3.8; Tampa, 3.5. Deficits: Shreveport, 5.3; Vicksburg, 5.2; Columbia, Mo., 4.2; Fort Smith, 4.1.

The *average departure* for each district is also given in Table I. By dividing these by the respective normals for this month the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normal exceeds 100):

Above the normal: New England, 128; middle Atlantic, 145; south Atlantic, 151; Florida Peninsula, 193; North Dakota, 124; northern slope, 120; north Pacific, 141.

Below the normal: east Gulf, 80; west Gulf, 30; Ohio Valley and Tennessee, 70; Lower Lake, 79; Upper Lake, 66; Upper Mississippi, 62; Missouri Valley, 62; middle slope, 35; Abilene (southern slope), 52; southern plateau, 00; middle plateau, 47; northern plateau, 58; middle Pacific, 49; south Pacific, 39.

The *years of greatest and least precipitation* are given in the REVIEW for April, 1894. The precipitation for the current month was the greatest on record at Northfield, 4.60; Block Island, 6.15; Narragansett Pier, 6.61; Raleigh, 7.95; Columbia, S. C., 5.91; Titusville, 4.50; Pensacola, 7.16; Lander, 5.71. It was the least on record at Cleveland, 1.38; Parkersburg, 1.32; Dubuque, 0.49; Davenport, 0.32; Topeka, 0.93; Kansas City, 1.19; Columbia, Mo., 1.04; Springfield, Mo., 1.10; Fort Smith, 1.41; Shreveport, 0.24; Santa Fe, 0.01; Yuma, 0.00; Red Bluff, 0.34; Salt Lake City, 0.73; Idaho Falls, 0.39.

The *total accumulated monthly departures* from normal precipitation from the beginning of the year to the end of the

current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	Per ct.		Inches.	Per ct.
New England	3.00	81	South Atlantic	2.40	113
Middle Atlantic	0.30	97	Florida peninsula	1.40	114
East Gulf	2.30	90	Northern slope	0.70	121
West Gulf	5.30	64			
Ohio Valley and Tenn.	4.80	73			
Lower Lakes	3.10	70			
Upper Lakes	2.50	71			
North Dakota	0.40	89			
Upper Mississippi	3.80	57			
Missouri Valley	2.40	68			
Middle slope	1.50	71			
Southern slope (Abilene) ..	2.10	74			
Southern plateau	0.70	68			
Middle plateau	0.50	91			
Northern plateau	2.40	68			
North Pacific	2.00	98			
Middle Pacific	1.80	89			
South Pacific	2.00	88			

Details as to excessive precipitation are given in Tables XIII and XIV.

The total snowfall at each station is given in Table II.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 16, 25, 26. Arizona, 23, 25, 30. Arkansas, 5, 6, 8, 15, 24, 25, 26. California, 1, 3, 8, 9, 13, 26, 27, 28. Colorado, 20, 26, 29. Connecticut, 1, 2, 6. Delaware, 14. District of Columbia, 13. Florida, 2, 17, 25. Georgia, 2, 3, 7, 16, 24. Idaho, 10, 16, 19, 20, 27, 28, 30. Illinois, 1, 11, 12, 21. Indiana, 1, 2, 5, 12, 25. Indian Territory, 25. Iowa, 1, 5, 6, 12, 21, 30. Kansas, 5, 12, 14, 15, 25, 28, 29, 30. Kentucky, 1, 12, 13, 14. Louisiana, 1, 3, 27. Maine, 23. Maryland, 2, 13, 14. Massachusetts, 2, 25. Michigan, 1, 11, 13, 14, 22. Minnesota, 6, 19, 25, 27, 30. Mississippi, 6, 7, 16, 24, 25, 27. Missouri, 7, 12, 14, 15. Montana, 20. Nebraska, 2, 5, 6, 19, 20, 27 to 30. Nevada, 14, 15, 25, 27, 28, 29. New Hampshire, 20, 23. New Jersey, 9. New Mexico, 21, 25, 30. New York, 9, 13, 23. North Carolina, 4, 7, 8, 12, 13. North Dakota, 28. Ohio, 1, 2, 7, 8, 12, 13, 14. Oklahoma, 4, 5, 24, 30. Oregon, 1, 3, 4, 6, 8, 9, 10, 16, 26, 27. Pennsylvania, 9, 13, 22. South Carolina, 2, 16, 24. South Dakota, 5, 26, 28, 30. Tennessee, 2, 6, 7, 14, 27. Texas, 5, 6, 21 to 26, 30. Utah, 14, 28, 29. Virginia, 1, 2, 12, 13, 14. Washington, 1 to 4, 9, 10, 11, 13, 15, 16, 17. West Virginia, 2, 13, 14. Wisconsin, 1, 11, 12, 13, 19, 26. Wyoming, 27, 29, 30.

SLEET.

The following are the dates on which sleet occurred in the respective States:

California, 4. Colorado, 1, 5, 6, 14, 15, 20. Connecticut, 3, 6. Georgia, 3. Idaho, 4, 13, 16. Illinois, 1. Iowa, 1. Kansas, 1, 5, 6, 15. Massachusetts, 1. Michigan, 1. Minnesota, 10, 11.